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CONFIGURATION MANAGEMENT PLAN

MARCH 6, 1998

DEFENSE MODELING AND SIMULATION OFFICE
ALEXANDRIA, VA

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MASTER ENVIRONMENTAL LIBRARY
(MEL)

CONFIGURATION MANAGEMENT PLAN

MARCH 6, 1998

VERSION 1.0

PREPARED BY:

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MASTER ENVIRONMENTAL LIBRARY
(MEL)

CONFIGURATION MANAGEMENT PLAN

MARCH 6, 1998

APPROVAL:

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CHIEF,
AIR & SPACE NATURAL ENVIRONMENT EXECUTIVE AGENT

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DIRECTOR,
OFFICE OF THE OCEAN EXECUTIVE AGENT

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CHIEF,
TERRAIN MODELING PROJECT OFFICE

FOREWORD

The DoD Modeling and Simulation Master Plan (MSMP), DoD 5000.59-P, October 1995, focused execution responsibility for authoritative representation of the natural environment on Executive Agents. The MSMP established sub-objectives for providing authoritative representations of the four natural environment domains (terrain, oceans, atmosphere, and space). Through separate letters the Under Secretary of Defense for Acquisition and Technology (USD(A&T)) designated the Defense Mapping Agency (now part of the National Imagery and Mapping Agency), Department of the Air Force, and Department of the Navy as Modeling and Simulation Executive Agents (MSEA) for terrain, atmosphere and space, and ocean, respectively.

The Master Environmental Library (MEL) project is part of the Modeling and Simulation community's initiative to provide an authoritative representation of the natural environment. The Technical Reference Guide is one of the supplementary documents that complement the MEL.

This document will be reviewed and updated by the MSEAs as required to maintain its currency. Comments and recommendations should be forwarded for review and possible inclusion to:

Office of the Ocean Executive Agent
Naval Research Laboratory
Code 7306
4555 Overlook Ave. SW
Washington, DC 20375
(202) 404-1426

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EXECUTIVE SUMMARY

The Master Environmental Library (MEL) is a network-based search and delivery system for information regarding the natural oceanographic, atmospheric, near-space, and terrain environments, stored at geographically diverse locations. The MEL project is sponsored by the Defense Modeling and Simulation Office (DMSO), and is being executed under the guidance of Modeling and Simulation Executive Agents (MSEAs) for these environments.

This Plan provides information and procedural guidance for Configuration Management (CM) of MEL components, and is organized as follows:

- Section 1 describes the Purpose and Scope of this document, and provides a brief Description of the MEL system.
- Section 2 lists Reference Documents pertaining to the CM of MEL components.
- Section 3 contains a Concept of Operations and describes the Acquisition Strategy for the MEL project.
- Section 4 describes the MEL project organization and identifies specific roles and responsibilities of organizations involved with CM of MEL components.
- Section 5 describes the procedures used for configuration planning, management, identification, control, status accounting, and auditing of MEL components.

SECTION 1. INTRODUCTION

1.1 PURPOSE & SCOPE

This *Configuration Management Plan (CMP)* provides comprehensive information and procedural guidance for planning, management, identification, control, status accounting and auditing of Configuration Items (CIs) associated with the *Master Environmental Library (MEL).* It focuses on CIs related to an *Initial Operational Capability (IOC)* of the MEL and is intended to complement, not replace, more specific guidance on this subject.

This Plan describes the CM concept of operations, acquisition strategy, organization and processes for the MEL project. It will be reviewed annually, and revised as needed to address subsequent enhancements or changes to the MEL.

1.2 DESCRIPTION OF SYSTEM

The MEL is a network-based search and delivery system for information stored at geographically diverse locations and related to natural oceanographic, atmospheric, space, and terrain environments. The MEL project is sponsored by the *Defense Modeling and Simulation Office (DMSO*), and is implemented under the guidance of *Modeling and Simulation Executive Agents (MSEAs)* for each of the environments.

The IOC system will include Computer Software Configuration Items (CSCIs) that are associated with identification, discovery, description, ordering and provision of MEL information. The CSCIs will be primarily hosted on systems at MEL Access Sites and Resource Sites, and include Commercial-Off-The-Shelf/Government-Off-The-Shelf (COTS/GOTS) software. No Hardware Configuration Items (HWCIs) have been identified as part of the MEL IOC project.

SECTION 2. REFERENCE DOCUMENTS

2.1 SPECIFICATIONS

a. Performance Specification for MEL IOC

2.2 STANDARDS

a. MIL–STD–498 Software Development and Documentation

b. MIL–STD–2549 Configuration Management Data Interface

2.3 MANUALS

a. Software User's Manual, MEL Version 1.0, Defense Modeling and Simulation Office (DMSO), 10 JUL 97

b. Software Center Operator Manual, MEL Regional Site Software (MRSS) Version 1.0, DMSO, 5 JUN 97

c. MEL User Manual for the Binary Universal Form for Representation (BUFR) of Meteorological Data Software, DMSO, 29 AUG 97

2.4 OTHERS

2.4.1 GOVERNMENT DOCUMENTS

2.4.1.1 DIRECTIVES

a. DODD 5000.1 Defense Acquisition

2.4.1.2 HANDBOOKS

a. MIL-HDBK-61 (Draft) Configuration Management Guidance

2.4.1.3 REGULATIONS

a.	DoD 5000.2-R	Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information Systems, 6 OCT 1997

2.4.2 NON-GOVERNMENT DOCUMENTS

a.	EIA Standard 632	Processes for Engineering a System, Electronic Industries Association
b.	EIA Standard 649	National Consensus Standard for Configuration Management, Electronic Industries Association

SECTION 3. CM CONCEPT OF OPERATIONS AND ACQUISITION STRATEGY

3.1 CM CONCEPT OF OPERATIONS

Acquisition reform initiatives significantly changed Department of Defense (DoD) Configuration Management practices in the last several years. A major share of configuration control authority has been shifted to Developers. However, the DoD Configuration Management activities still provide assurance of supportability and interoperability.

> **NOTE** - Current DoD guidance states that in this context, the term Developers may be used to describe contractors and/or Government activities.

CM strategies must be consistent with acquisition, logistic support, and maintenance philosophies for each item. Specific CM objectives for the MEL project include the following:

a. **Configuration Identification** - by selecting CIs, determining types of required configuration documentation and proper configuration control authority for each CI, issuing and maintaining configuration identifiers, releasing configuration documents, and establishing configuration baselines for control of the CIs.

b. Configuration Control - by establishing/maintaining a systematic management process to regulate life-cycle costs, allow optimal latitude in design and development within change control procedures, provide efficient processing and implementation of changes to enhance operational value, ensure timely and accurate document changes, and eliminate proliferation of unnecessary changes.

c. Configuration Status Accounting - by providing a reliable source for MEL configuration information to support project management, systems engineering, software development and maintenance, logistic support and modification.

d. Configuration Auditing - by verifying initial configurations and incorporation of approved engineering changes to ensure that CIs meet stated requirements, and by auditing configuration verification records and physical products to validate that the development has met the requirements and that the associated documentation is consistent with the developed system.

The overall CM concept of operations is to control MEL products, processes and related documentation. These efforts will include: identifying, documenting and verifying functional and physical characteristics, recording item configuration, and controlling changes to items and their associated documentation. This is intended to provide an audit trail of decisions and design modifications over the MEL life-cycle.

3.2 CM ACQUISITION STRATEGY

In accordance with current DoD reform initiatives, the CM acquisition strategy for MEL will be based primarily upon *Performance Specifications.* In a performance-based acquisition, the Government controls the specified performance of the item, leaving the design solution and its implementation to the Developer. Only where absolutely necessary, will the Government assume the configuration control of the product baseline. This strategy relieves the Government Configuration Manager of the burden of considerable hands-on processing of change proposals at the detailed design level.

3.2.1 VALIDATED REQUIREMENTS

A set of tentative requirements were developed and submitted to the MSEAs for approval and validation. Once validated, these will be used as a basis for the *Functional Baseline* for the current implementation of the MEL system.

3.2.2 PERFORMANCE SPECIFICATIONS

Performance Specifications for MEL will be based on the validated requirements. They will be drafted by the Developers, and submitted to the MSEAs for approval.

3.2.3 CONFIGURATION ITEM IDENTIFICATION

Specific CIs will be proposed by the Developer, and submitted to the MSEAs for approval. Once approved and allocated in the Performance Specifications, they will be used as a basis for the *Allocated Baseline* for the current system implementation of MEL. As previously noted, no HWCIs have been identified for the MEL IOC implementation.

3.2.4 CONFIGURATION BASELINES

The CM Acquisition Strategy for the MEL project will include: a *Functional Baseline* defined by validated requirements, an *Allocated Baseline* as described in the Performance Specification, and a *Product Baseline* established after the verification of design documentation. The Government will take control of all of these Configuration Baselines for the MEL project at the appropriate times.

3.2.5 DEVELOPMENT CONFIGURATION

This is used to describe the Developer's design and associated documentation that defines the Developer's evolving design solution during CI development. The Development Configuration consists of a Developer's internally-released software and associated documentation that is under the configuration control of the Developer. This information will not be released externally without the prior written approval of the appropriate CM authority for the MEL project.

3.2.6 STATUS ACCOUNTING REQUIREMENTS

Configuration Status Accounting (CSA) functions will be performed for the Government by the CM support contractor (MAR, Incorporated). These will include:

- Recording current approved configuration documents and identifiers
- Recording and reporting the status of proposed engineering changes
- Recording and reporting all major requests for deviation affecting CIs
- Recording and reporting results of configuration audits and action items
- Recording and reporting implementation status of authorized changes
- Providing traceability of all changes from original configuration documents
- Reporting effectiveness and installation status of all configuration changes
- Recording digital data file identifiers and document representing changes

SECTION 4. ORGANIZATION

4.1 RELATIONSHIPS WITHIN PROJECT

4.1.1 SPONSOR

The Sponsor is responsible for reviewing and coordinating validation of requirements, and for providing overall programming and funding guidance to the Project Manager. DMSO is the Sponsor for MEL, assisted by the MSEAs.

4.1.2 PROJECT MANAGER

The MEL Project Manager is responsible for interacting with the Sponsor and other project personnel, coordinating actions of the MSEAs, and providing more specific programming and funding guidance to the MEL Project Leader. The Lead MSEA serves as the MEL Project Manager.

4.1.3 PROJECT LEADER

The MEL Project Leader interacts with the MSEAs and other members of the project team, coordinates technical and support activities, responds to guidance from the Project Manager, and manages allocated funding. The MEL Project Leader is Dr. Richard Siquig at the Naval Research Laboratory (NRL) Marine Meteorology Division in Monterey, CA.

4.1.4 CONFIGURATION MANAGER

The MEL Configuration Manager, with support from MAR Incorporated, is responsible for oversight and management of the CM program, coordination of associated activities, and responding to direction of senior project management.

4.1.5 INTEGRATED PRODUCT TEAMS

Integrated Product Teams (IPTs), comprised of Government and contractor personnel, will be established as needed and used to facilitate the interaction and communications among the parties involved in CM. IPTs will be established as needed. The training and experience of IPT members, and the guidance and resources they are provided, will impact the effectiveness of CM for the MEL.

4.2 IDENTIFICATION OF CM MANAGER

The Task Leader for Customer Relations will assist the MEL Project Leader in serving as CM program Manager during design and development of MEL IOC.

4.3 RELATIONSHIPS WITH RELATED COMMANDS

Specific relationships with activities serving as MEL Access or Resource Sites will be described in Memoranda Of Understanding (MOUs). Table 1 lists current MEL Access and Resource Sites:

Table 1. MEL Access and Resource Sites

MEL ACCESS SITES:[1]
Naval Research Laboratory, Marine Meteorology Division, Monterey, CA (NRL Monterey) *http://mel.dmso.mil*
National Imagery and Mapping Agency (NIMA), Bethesda, MD *[Classified Site]* *http://204.37.97.214/atlas/mel/homepage.html*
MEL RESOURCE SITES:
Air Force Combat Climatology Center (AFCCC), Scott AFB, IL
Air Force Weather Agency (AFWA), Offutt AFB, NE
Center for Air Sea Technology (CAST), Stennis Space Center, MS
National Geophysical Data Center (NGDC), Boulder, CO
National Imagery and Mapping Agency (NIMA), Bethesda, MD[2] *[Classified site]*
National Imagery and Mapping Agency (NIMA), Fairfax, VA[3] *[Unclassified site]*
Naval Research Laboratory, Marine Meteorology Division, Monterey, CA (NRL Monterey)
Simulator Data Base Facility (SDBF), Kirkland AFB, NM

[1] MEL Access Sites will be moved to the Modeling and Simulation Operational Support Activity (MSOSA) by September 1998.

[2] The NIMA Classified MEL Resource Site is scheduled to move from Bethesda, MD to St. Louis, MO by March 1998.

[3] The NIMA Unclassified MEL Resource Site is scheduled to move from Fairfax, VA to Bethesda, MD by July 1998.

4.4 RESPONSIBILITIES AND AUTHORITIES

The organizations described in the following paragraphs have major responsibilities and authorities with regard to the CM program for the MEL project. The standing members are comprised of activities that are directly involved in management, technical direction, development, testing, implementation and life-cycle support of MEL components. They include representatives of the MSEAs, the Software Review Board (SRB), the Software Development Group (SDG), the Software Test Team (STT), and the Life-Cycle Support Activity (LCSA); in addition to representatives of the MEL user community, Access and Resource sites, as appropriate. Besides the standing members, it is also important to note that other activities may be invited to participate in these functions as appropriate.

4.4.1 CONFIGURATION CONTROL BOARD

The MEL Configuration Control Board (CCB) is responsible for evaluating and approving all: major or critical Deviations and Waivers, Class I Engineering Change Proposals (ECPs) and Notices Of Revision (NORs). The MEL CCB will also be responsible for ensuring that all approved changes are properly implemented. The standing members of the MEL CCB include:

Chair .....MEL Project Manager

Secretary .....MEL Project Leader

Member.....Air/Space MSEA Representative

Member.....Terrain MSEA Representative

Member.....Ocean MSEA Representative

Member.....SRB Representative

Member.....SDG Representative

Member.....STT Representative

Member.....LCSA Representative

Member.....MEL User Representative

Others activities may be invited to participate in certain CCB functions, as appropriate.

4.4.2 SOFTWARE REVIEW BOARD (SRB).

The SRB will: assist the CCB with technical review and evaluation of proposed changes to CSCIs enhance technical communications and resolve technical conflicts, and provide technical comments and recommendations to the CCB about disposition of proposed software changes. Standing members of the MEL SRB include:

Chair .....MEL Project Leader

Secretary .....CM Support Contractor

Member.....MAR, Incorporated

Member.....CAST

Member.....STT Representative

Member.....LCSA Representative

Member(s) .....Access Site Representative(s)

Member(s) .....Resource Site Representative(s)

Other activities may be invited to participate in specific functions, as appropriate.

4.4.3 SOFTWARE DEVELOPMENT GROUP (SDG)

The SDG will ensure that the CIs used in MEL are designed, documented, developed and implemented in accordance with the validated requirements, Performance Specifications, and current configuration baseline. Standing members of the SDG include:

Chair .....MEL Project Leader

Secretary .....CM Support Contractor

Member .....MAR, Incorporated

Member.....CAST

Member.....NRL Washington, DC

Member(s) .....Access Site Representative(s)

Member (s) .....Resource Site Representative(s)

Other activities may be invited to participate in specific functions, as appropriate.

4.4.4 SOFTWARE TEST TEAM (STT)

The STT will: ensure that CSCIs are not corrupted during integration; ensure that the MEL interface lets users access and manipulate data easily, efficiently, and with minimal opportunity for error; help review and evaluate proposed software test plans, procedures, and criteria; help with the verification of proposed software and scheduling and coordination of system-level tests; monitor informal testing and manage formal testing of MEL software; and approve Software Test Report (STR) documents. Standing members of the STT include:

Chair .....NRL Washington

Secretary .....CM Support Contractor

Member.....MAR, Incorporated

Member.....CAST

Member(s) .....Access Site Representative(s)

Member (s) .....Resource Site Representative(s)

Other activities may be invited to participate in specific STT functions, as appropriate.

4.4.5 INTEGRATION OF CM ACTIVITIES WITH OTHER ACTIVITIES

As a performance-based strategy, the CM program for MEL is very closely linked to many other project activities. The MEL Performance Specifications are not only the basis for CM activities, they also provide a foundation for all subsequent design, development and testing functions. CM activities are also critical elements of the consolidated Plan Of Action & Milestone (POA&M) schedule for the MEL project, and affect several key milestone decisions.

4.4.6 INTERFACES WITH CM MANAGER

Because of the close interrelationships, it is expected that there will be regular communications among MEL project management, development, testing and documentation personnel and the CM Manager. Appropriate communications are encouraged to make the CM processes most effective and efficient for all.

SECTION 5. THE CM PROCESS

5.1 DESCRIPTION OF THE PROCESS

As described in the following paragraphs, CM principles will be applied during all the phases of the MEL project, from identification of tentative requirements through life-cycle support. Because it is so closely related to other critical project activities, it is extremely important that all parties involved understand and support these principles.

5.2 CM PLANNING AND MANAGEMENT

5.2.1 CM PROGRAM GUIDANCE

This document describes the CM concept of operations, acquisition strategy, organization and procedures for Phase I and Phase II of the MEL project. It is a comprehensive top-level management document that is designed to complement, not replace, more specific or detailed guidance. This Plan establishes the composition, roles and responsibilities of organizations involved in CM for the MEL project, and is an important step toward implementing the CM program. Those individuals and organizations mentioned are encouraged to become familiar with contents of this CMP and the documents referenced herein.

5.2.2 CM TRAINING

Current DoD initiatives emphasize the importance of providing training in CM policies and procedures as early as possible to key participants. In the case of MEL, this will include training sessions provided by the CM Support Contractor (MAR, Incorporated) prior to starting the Design phase of the MEL project.

5.3 CONFIGURATION IDENTIFICATION

5.3.1 REQUIREMENT IDENTIFICATION & VALIDATION

Identification and validation of requirements are not traditionally considered to be part of the CM process itself, but do constitute important preliminary steps in some cases. Tentative requirements may be subject to risk assessments prior to validation. However, it is important to note that validated requirements are used as the basis for establishing the *Functional Baseline* for the system.

5.3.2 PERFORMANCE SPECIFICATIONS

Under performance-based CM strategies, the Government uses *Performance Specifications* to control CI changes. In such cases, the Government (via the CCB) maintains configuration control over changes affecting the Performance Specifications, but leaves the majority of design solutions and implementations to the Developer(s). Once allocated to specific CIs, Performance Specifications are used as the basis for establishing an *Allocated Baseline* for the system and as a road map for the subsequent design, documentation and testing activities.

5.3.3 REQUIREMENTS TRACEABILITY

A *Requirements Traceability Matrix*, developed and maintained for the Project Leader and CM Manager by the CM Support Contractor (MAR, Incorporated), will be used to track the validated requirements through design, development and testing.

5.3.4 CONFIGURATION DOCUMENTATION

Proper documentation is an essential and critical part of the CM process. It is required to establish and track requirements, define performance specifications, identify configuration items, describe configuration baselines, develop product testing criteria, and perform life-cycle support functions. This documentation includes:

a. Functional Baseline Configuration Documents:

- Configuration Management Plan
- List of Validated Requirements

b. Allocated Baseline Configuration Documents:

- Performance Specifications
- Design Specifications
- Test Documentation

c. Product Baseline Configuration Documents:

- (Verified) Product Descriptions
- (Verified) Life-Cycle Support Documents

5.3.5 DOCUMENT AND SOFTWARE IDENTIFICATION

The identification scheme used for all of the MEL configuration items (software and documents) is compatible with the guidance in MIL-STD-2549, and will include the following three Groups:

a. CAGE Code - The Commercial and Government Entity (CAGE) code identifies the originator. Since DMSO does not currently have a CAGE code, the letters "DMSO" will be used for this Element until further notice

b. Project Unique Identifier (PUI) - The PUI for MEL items will consist of the following Elements:

(1) Prefix - In this case, this Element will be always the term "MEL", followed by a hyphen (i.e., MEL-).

(2) Identifier - This Element denotes the specific software or documentation item. One of the following Identifiers will be used for MEL software items:

- **MASS** - The MEL Access Site Software CSCI
- **MRSS** - The MEL Resource Site Software CSCI
- **MSAS** - The MEL Services Architecture Software CSCI
- **MTSS** - The MEL Testing Support Software CSCI
- **PDSS** - The Public Domain and Support Software CSCI

Conversely, one of the following Identifiers will be used for MEL documentation items:

- **BUFR** - The BUFR Software Library User Manual
- **CMP** - The Configuration Management Plan
- **CSAP** - The Computer Security Accreditation Plan
- **GRIB** - The GRIB Software Library User Manual

- **OCD** - The Operational Concept Description
- **PSPEC** - The Performance Specification
- **SCOM(*CSCI*)** - The Software Center Operator Manual for a CSCI
- **SDD** - The Software Design Description
- **SFUG** - The Security Features User Guide
- **STP** - The Software Test Plan
- **STR** - The Software Test Report
- **SUM** - The Software User Manual
- **SVD(*CSCI*)** - The Software Version Description for a CSCI
- **TFM** - The Trusted Facility Manual
- **TRG** - The Technical Reference Guide
- **TRP** - The Transition Plan

(3) Suffix - A single item may have more than one form, and this Element of the PUI is used to describe that specific representation. It will consist of a hyphen and one of the following codes:

- **CODE** - Executable Code
- **PAPER** - Paper
- **HTML** - Hypertext Markup Language file
- **PDF** - Acrobat Reader file
- **MSW** - Microsoft Word file
- **ASCII** - ASCII file

c. Number - This three-character alphanumeric Element will consist of numbers or upper-case letters (except the letter "O"), that typically are assigned sequentially. Software or document version numbers will be displayed in here without the decimal and with the right-hand number representing the decimal version of the item (e.g., version 1.2 would be shown as 012). Serialized documents such as Engineering Change Proposals (ECPs) will display their serial number in this.

Examples:

(1) Version 1.1 of the SCOM (MASS) in an HTML form would be:

DMSO MEL-SCOM(MASS)-HTML-011

(2) Version 2.0 of the PDSS CSCI software would be:

DMSO MEL-PDSS-ASCII-020

MEL software and documents will also include the date of issuance. Documents will display this date on the cover and at the bottom of each page.

5.4 CONFIGURATION CONTROL

5.4.1 CONFIGURATION CONTROL AUTHORITY

Configuration Control Authority for changes to the Performance Specifications will reside with the CCB throughout the MEL project, and all changes that may affect specified performance, form, fit, function, interchangeability, and interface must have prior written approval of the CCB. During Phase I and Phase II, the Configuration Control Authority for design changes will be the SDG, provided all such changes are consistent with current Performance Specifications and are properly documented in accordance with MEL project documentation.

5.4.2 CURRENT DOCUMENT CHANGE AUTHORITY (CDCA)

The currently approved configuration documentation constitutes the Configuration Baseline. Because of this, the CDCA will transition from the SDG to the CCB as documents are approved. Changes to approved CIs or configuration documentation must follow the Engineering Change Proposal process outlined in the next section.

5.4.3 ENGINEERING CHANGE PROPOSALS (ECPs)

ECPs will be used to manage all changes to the: Performance Specifications, CIs or baseline configuration documentation. ECPs may be solicited by the Government or suggested by developers or others. Instances where unsolicited ECPs may be justified include the correction of defects, or improvements to safety, compatibility, security, reliability or the end product. The following paragraphs describe ECP Classes, Types, Class I ECP Priorities, and ECP Handling Procedures.

5.4.3.1 ECP CLASSES

A Class I ECP proposes a change to approved CIs or documentation for which the Government is the CDCA, and affects:

- A physical or functional requirement in any approved configuration documentation

- Any approved functional, allocated or product configuration document and warranties, costs or contract milestones
- Approved product configuration documentation and one or more of the following:
    - Hazards to Safety
    - Government Furnished Items
    - Will require retrofitting of delivered items
    - Compatibility, interoperability or logistic support
    - Unfunded changes to delivered technical documents
    - Skills, training, manning, or human engineering design

A *Class II ECP* proposes a change to approved CIs or documentation for which the Government is the CDCA, and which does not meet the above criteria for Class I ECPs. Any changes that do not affect approved CIs or configuration documentation do not require an ECP for the MEL project.

5.4.3.2 ECP TYPES

Preliminary ECPs are used to assess the impact of proposed changes in sufficient detail to determine if Formal ECPs are warranted. They are used when:

- The proposed change may require additional funding, development or engineering
- Several alternatives to the change must be considered
- Additional funds are needed to develop a Formal ECP
- The Government wishes to restrict configuration changes
- Approval is needed to proceed with software development

Formal ECPs provide sufficient engineering information and other data to support formal CCB approval and implementation of the proposed change.

5.4.3.3 CLASS I ECP PRIORITIES

An *Emergency* priority will be assigned to Class I ECPs to: effect changes in operational characteristics which if not accomplished without delay may seriously compromise national security, correct a hazardous condition that may result in serious or fatal injuries or extensive damage to equipment, or correct a system halt in the production environment such that the mission cannot be accomplished.

An *Urgent* priority will be assigned to Class I ECPs to: effect a change which may seriously compromise mission effectiveness if not accomplished expeditiously, correct a potentially hazardous condition that could result in injury or damage to equipment, effect a change which if delayed would result in schedule slippage or increased cost, effect a significant savings in life-cycle costs, correct a condition causing unusable output information that is critical to mission accomplishment, effect a change in operational characteristics to satisfy a new or changed requirement, or correct critical CI files that are being degraded.

A *Routine* priority will be assigned to Class I ECPs when emergency or urgent implementation is not applicable, required or justifiable.

5.4.3.4 ECP HANDLING PROCEDURES

Preliminary ECPs will be prepared in the format provided in Appendix B, and forwarded to the Secretary of the SRB with information copies to the Secretary of the CCB and Chairs of the SDG and STT. ECP originators should notify these parties immediately by electronic message (e.g., e-mail, fax) if the proposed change meets the above criteria for an Emergency or Urgent ECP, followed up by the submission of a *Formal ECP* within 30 days. The SRB will evaluate these Preliminary ECPs and recommend further actions.

Formal ECPs will also be prepared in the format provided in Appendix B, and forwarded to the Secretary of the CCB with information copies to the Secretary of the SRB and Chairs of the SDG and STT. As before, ECP originators should notify these parties immediately by electronic message (e.g., e-mail, fax) if the proposed change meets the criteria for an Emergency or Urgent ECP. The CCB will evaluate the Formal ECPs and initiate further action. The implementation of an approved change to a CI must always include its incorporation into all associated configuration documentation. Approved changes will be implemented to optimize results and minimize disruptions on operational activities.

5.4.3.5 ECPS INVOLVING OFF-THE-SHELF ITEMS

In addition to all the above, Formal ECPs proposing the integration of existing, off-the-shelf software components shall include all pertinent STRs or similar documents regarding the results of quality assurance testing of the proposed components.

5.4.4 NOTICE OF REVISION (NOR)

A NOR identifies configuration documents impacted by a proposed change, and describes how each will be affected. Originators should attach a NOR, prepared in the format shown in Appendix C to *all Formal ECP* submissions.

5.4.5 REQUEST FOR DEVIATION (RFD)

A deviation is a specific written authorization to depart from requirements for a specific CI, for a specific number of units or a specified period of time. RFDs are typically used for production CIs delivered as part of a production contract. While mentioned here for the sake of completeness, it is not currently expected that RFDs will be required in the MEL project in the foreseeable future.

5.4.6 SOFTWARE TROUBLE REPORTING

Software Trouble Reports and similar user feedback procedures are usually handled via the LCSA, and do not necessarily become part of the CM process. Ones that do result in further CM action however, will be recorded and tracked appropriately.

5.5 CONFIGURATION STATUS ACCOUNTING

CSA provides a reliable source of configuration information for project management, system engineering, software development and life-cycle support functions. The CM support contractor will provide the CSA for the MEL project, which will include the following:

- Recording current approved configuration documents and identifiers
- Recording and reporting the status of proposed engineering changes
- Recording and reporting all major requests for deviation affecting CIs
- Recording and reporting results of configuration audits and action items
- Recording and reporting implementation status of authorized changes
- Providing traceability of all changes from original configuration documents
- Reporting effectiveness and installation status of all configuration changes
- Recording digital data file identifiers and document representing changes

The CM support contractor will also maintain the master library for all approved CIs and configuration documentation used in the MEL project.

5.6 CONFIGURATION VERIFICATION AND AUDITS

MEL CIs and associated as-built configuration documentation will be subject to the configuration verification and audit process to:

- Verify that initial configurations and subsequent incorporation of approved engineering changes to the CIs meet stated requirements
- Audit physical products and configuration verification records to ensure development has met requirements and it is reflected in the documentation

Successful completion of verification and audit activities will result in verified system CIs and documentation that may be considered to be the MEL *Product Baseline.*

5.6.1 CONFIGURATION VERIFICATION

This process is used by the Developer and the Government to verify the design solution, and as such, it encompasses all the testing and demonstrations done to satisfy the quality assurance criteria stated in the Performance Specifications. It includes:

a. Informal Unit/Module Tests. Developers will perform informal tests on the lowest compiled units within programs under their cognizance. These tests may consist of: peer review, error-free compilation, exercise of logical execution paths, data flow analysis, and/or validation of intended function(s).

b. Informal Product-Level Tests. Developers will also conduct informal testing at the product-level to ensure that software satisfies functional and performance specifications when operated in a stand-alone, vice integrated, fashion.

c. Formal Product-Level Tests. Formal product-level testing will be performed by the developers and witnessed by the STT to verify that the product complies with established performance requirements.

d. Formal System-Level Tests. Formal system-level tests will be conducted by the LCSA, witnessed by the STT, and chaired by the MEL Project Manager .

e. Formal Acceptance Tests. Formal Acceptance Tests will be performed to ensure that the integrated software product performs in an acceptable manner in preparation for system-level testing. The MEL LCSA will be responsible for coordination of these tests, assisted as necessary by the STT.

More detailed information regarding Developmental Testing (DT), Operational Testing (OT) and Acceptance Testing will be include in separate test planning documents.

5.6.2 CONFIGURATION AUDITS

As previously mentioned, CM is used to define and control the Configuration Baselines for the CIs, associated documentation, and the system as a whole. Performance Specifications describe essential performance requirements and constraints. As Performance Specifications are baselined, these requirements become contractual, so it is prudent for the Government to ascertain that the Developer has indeed provided all the required performance capabilities. Because development includes the generation of product documentation, it is also prudent that the Government determine that this documentation accurately represents the delivered design, since the operation and life-cycle support of the CIs is dependent upon this documentation. The following Configuration Audits are used to verify that the Developer's efforts have successfully satisfied all the requirements described in the Configuration Baselines:

a. Functional Configuration Audit (FCA). An FCA will be conducted to verify that the actual performance of the individual CIs meet approved Performance Specifications.

b. Physical Configuration Audit (PCA). A PCA will be conducted to examine the actual configuration of the CIs to verify that the associated documentation matches the delivered design, and to verify that any CI element changed after the FCA still meet Performance Specifications.

It is currently anticipated that the FCA and PCA will be conducted toward the end of Phase II under the MEL IOC implementation.

5.7 SUMMARY

This document provides a foundation for establishment and implementation of a CM program for the MEL project. It incorporates the latest changes in DoD guidance on this subject, and addresses the CM concept of operation, strategy, organization and procedures for the MEL. It provides formats for the submission and the handling of ECPs and NORs, and describes CM activities in appropriate detail for a document of this type. It is recommended that all individuals and organizations involved with the MEL project become familiar with the information contained herein.

APPENDIX A. ACRONYMS & ABBREVIATIONS

AFCCC ..... Air Force Combat Climatology Center

AFWA ..... Air Force Weather Agency

ASCII ..... American Standard Code for Information Interchange file

BUFR ..... Binary Universal Form for Representation of meteorological data

CAGE ..... Commercial And Government Entity

CAST ..... Center for Air Sea Technology

CCB ..... Configuration Control Board

CDCA ..... Current Document Change Authority

CIs ..... Configuration Items

CM ..... Configuration Management

CMP ..... Configuration Management Plan

COTS ..... Commercial-Off-The-Shelf

CSA ..... Configuration Status Accounting

CSAP ..... Computer Security Accreditation Plan

CSCI ..... Computer Software Configuration Item

CSCIs ..... Computer Software Configuration Items

DDR&E ..... Director, Defense Research and Engineering

DMSO ..... Defense Modeling and Simulation Office

DoD ..... Department of Defense

DoDD ..... Department of Defense Directive

DT ..... Developmental Testing

ECPs ..... Engineering Change Proposals

EXCIMS ..... Executive Council on Modeling and Simulation

FCA .....Functional Configuration Audit

GOTS.....Government-Off-The-Shelf
GRIB.....Gridded Binary

HTML.....Hypertext Markup Language
HWCIs.....Hardware Configuration Items

IOC .....Initial Operational Capability
IPTs.....Integrated Product Teams

LCSA.....Life-Cycle Support Activity

M&S .....Modeling and Simulation
MASS .....MEL Access Site Software
MEL.....Master Environmental Library
MOUs .....Memoranda Of Understanding
MRSS .....MEL Regional Site Software
MSAS .....MEL Services Architecture Software
MSEAs .....Modeling and Simulation Executive Agents
MSOSA .....Modeling and Simulation Operation Support Activity
MSW.....Microsoft Word file
MTSS.....MEL Testing Support Software

NGDC.....National Geophysical Data Center
NIMA.....National Imagery and Mapping Agency
NOR.....Notice Of Revision
NRL .....Naval Research Laboratory

OCD.....Operational Concept Description
OT.....Operational Testing

PCA ..... Physical Configuration Audit

PDF ..... Portable Document File

PDSS ..... Public Domain and Support Software

POA&M ..... Plan Of Action & Milestone

PSPEC ..... Performance Specification

PUI ..... Project Unique Identifier

RFD ..... Request for Deviation

SCOM ..... Software Center Operator Manual

SDBF ..... Simulator Data Base Facility

SDD ..... Software Design Description

SDG ..... Software Development Group

SFUG ..... Security Features User Guide

SRB ..... Software Review Board

STP ..... Software Test Plan

STR ..... Software Test Report

STT ..... Software Test Team

SUM ..... Software User Manual

SVD ..... Software Version Description

TFM ..... Trusted Facility Manual

TRG ..... Technical Reference Guide

TRP ..... Transition Plan

USD(A&T) ..... Undersecretary of Defense for Acquisition and Technology

APPENDIX B. MEL ECP FORMAT

ECP Identification **(CCB Use only)**:		
Security, Distribution, Data Rights Constraints:		
ECP Type	ECP Classification	ECP Priority
ECP Justification Code **(CCB Use only)**:	CDCA and Effective Date **(CCB Use only)**:	Current ECP Status & Date: **(CCB Use only)**:
Originator & Point of Contact:		
Activities[4] & Status Of Adoption Or Rejection Of ECP Change: **(CCB Use only)**:		
Baseline Affected **(CCB Use only)**:	Primary And Related ECPs, If Any **(CCB Use only)**:	
Order of Implementation (Before, With, After Other Retrofit ECPs):		
Description of Change (Summary):		
Need For Change (Summary):		
Identification of Supplemental or Affected Documents (Flag, Type, Source, Identifier, Rev. and specific affect):		
Affected Part/Material/Software Identification:		

[4] Indicates there are several Government Activities baselining or using CI

Associated Requirements:
Trade-Offs & Alternate Solutions:
Effect on Operational Employment:
Effect on Operational, Maintenance Or Training Software:
Consequences of Disapproval:
Other Considerations:
Effect on CI Nomenclature:
Total Costs/Savings:
DoD Service component Bearing Cost:
Associated NOR(S), If Applicable:

APPENDIX C. MEL NOR FORMAT

Description of NOR, Related ECP and Revision:
Assigned NOR Number **(CCB Use only)**:
Security, Distribution, Data Rights Constraints:
Originator Name and Point(s) of Contact::
Identification of Affected Document(s): (Include Title, Source, Identifier, Version)
Specific Changes Required:
Change to Notes:
Remarks: